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| 09/916,316 | 07/30/2001 | Minoru Waki | 010974 | 8006 |

23850 7590 07/18/2003

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| EXAMINER |
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SHOSHO, CALLIE E

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| ART UNIT | PAPER NUMBER |
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1714

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DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,316

Applicant(s)

WAKI ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/15/03 and 4/29/03.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. All outstanding rejections except for those described below are overcome by applicants' amendment filed 4/15/03 and 1.132 declaration filed 4/29/03.

The following action is non-final in light of the new grounds of rejection as set forth below with respect to Watanabe et al. (U.S. 6,274,646) as well as the use of a new reference against the present claims, namely, EP 892024.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-3, 5-8, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (U.S. 6,274,646) in view of Ohta et al. (U.S. 5,954,866) and EP 892024.

Watanabe et al. disclose ink jet ink comprising water, solvent, penetrating agent such as diethylene glycol monobutyl ether, surfactant, sugar, dispersant, and methyl methacrylate/butyl acrylate/acrylic acid random copolymer which has acid number of 50-100 wherein the ratio of polymer to dispersant is 1:0.06 to 1:3. The ink is used in an ink jet printer in order to produce printed substrate (col.1, lines 7-10 and 40-60, col.2, lines 36 and 47, col.3, lines 5, 14, 25-30, and 32, col.3, line 65-col.4, line 21, and col.5, lines 23-25).

The difference between Watanabe et al. and the present claimed invention is the requirement in the claims of styrene-maleic anhydride.

Watanabe et al. disclose the use of dispersant such as styrene-maleic acid, however, there is no disclosure of styrene-maleic anhydride dispersant as presently claimed.

Ohta et al., which is drawn to ink jet inks, disclose the use of styrene-maleic anhydride dispersant in order to stably disperse pigment. Ohta et al. also disclose the equivalence and interchangeability of styrene-maleic anhydride dispersant, as presently claimed, with styrene-maleic acid dispersant as disclosed by Watanabe et al. (col.5, lines 30-31 and 59-61).

There is no disclosure in Ohta et al. of the acid number of the styrene-maleic anhydride dispersant. EP 892024, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride dispersant which has acid number of 100-250 in order to prevent color bleed as well as produce image with higher color density (page 3, lines 43-46 and 51-55).

In light of the disclosure of Ohta et al. of the equivalence and interchangeability between styrene-maleic anhydride dispersant and styrene-maleic acid dispersant and in light of the disclosure of EP 892024 of using styrene-maleic anhydride dispersant with specific acid number, it therefore would have been obvious to one of ordinary skill in the art to use such styrene-maleic anhydride dispersant in the ink of Watanabe et al., and thereby arrive at the claimed invention.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Ohta et al. and EP 892024 as applied to claims 1-3, 5-8, and 10-11 above, and further in view of Zhu (U.S. 5,889,083).

The difference between Watanabe et al. in view of Ohta et al. and EP 892024 and the present claimed invention is the requirement in the claims of surfactant of presently claimed formula VI, i.e. acetylene glycol.

Zhu, which is drawn to ink jet inks, disclose the use of acetylene glycol in order to prevent foaming of the ink during preparation as well as printing (col.10, lines 12-18 and 31-44).

In light of the motivation for using specific surfactant disclosed by Zhu as described above, it therefore would have been obvious to one of ordinary skill in the art to use such surfactant in the ink of Watanabe et al. in order to prevent ink from foaming during preparation and printing, and thereby arrive at the claimed invention.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Ohta et al. and EP 892024 as applied to claims 1-3, 5-8, and 10-11 above, and further in view of either Sacripante et al. (U.S. 6,329,446) or Cheng et al. (U.S. 6,239,193).

The difference between Watanabe et al. in view of Ohta et al. and EP 892024 and the present claimed invention is the requirement in the claims of volume average particle size of the pigment.

Sacripante et al., which is drawn to ink jet inks, disclose the use of pigment with volume average particle size of 0.01-3 μm in order to prevent clogging of ink jet printer (col.6, lines 36-43).

Alternatively, Cheng et al., which is drawn to ink jet inks, disclose the use of pigment with volume average particle size of 0.01-1 μm wherein preferably at least 90% of the particles have size below 0.1 μm with no particles having size greater than 1 μm in order to prevent clogging of ink jet printer (col.12, lines 5-20).

In light of the motivation for using pigment with specific volume average particle size disclosed by either Sacripante et al. or Cheng et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in the ink of Watanabe et al. in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

Response to Arguments

6. Applicants' arguments filed 4/15/03 regarding Zhu (U.S. 5,889,083) and Anton et al. (U.S. 6,005,023) have been fully considered but they are moot in view of the discontinuation of these references against the present claims.

Specifically, Zhu (U.S. 5,889,083) discloses ink jet ink comprising water, solvent, pigment, acetylene glycol surfactant corresponding to presently claimed formula VI, penetrating agent such as ethylene glycol ethyl ether, and one or more binders which each have acid number of 20-500 and which include styrene-maleic anhydride and polymer obtained from monomers which include methyl methacrylate, butyl acrylate, and acrylic acid.

Anton et al. (U.S. 6,005,023) disclose ink jet ink which comprises water, solvent, pigment, surfactant, 0.1-25% dispersant which is obtained from monomers including methyl methacrylate, alkyl acrylate, and acrylic acid and 0.1-20% emulsion polymer additive obtained from monomers including styrene and maleic anhydride

Upon reconsideration, it is the examiner's position that neither Zhu nor Anton et al. are proper 35 USC 102 references against the present claims. While Zhu discloses the use of styrene-maleic anhydride copolymer as one of several binder polymers, there is no explicit disclosure to

use combination of styrene-maleic anhydride copolymer and methyl methacrylate/butyl acrylate/acrylic acid copolymer as presently claimed. Zhu disclose the use of acrylic resin which is obtained from monomers which include methyl methacrylate, butyl acrylate, and acrylic acid, however, there is no disclosure of using copolymer obtained from these three monomers and further the use of two polymers is not even required in Zhu. Anton et al. disclose dispersant which is obtained from monomers including methyl methacrylate, alkyl acrylate, and acrylic acid and emulsion polymer additive obtained from monomers including styrene and maleic anhydride, however, there is no disclosure of styrene-maleic anhydride copolymer or methyl methacrylate/butyl acrylate/acrylic acid, and no disclosure of using combination of these specific polymers.

While Zhu and Anton et al. each fails to exemplify the presently claimed ink nor can the ink be "clearly envisaged" from either reference as required to meet the standard of anticipation (cf. MPEP 2131.03), nevertheless, in light of the overlap between the claimed ink and that disclosed by either Zhu and Anton et al., it is obvious that it would have been within the bounds of routine experimentation, as well as within the skill level of one of ordinary skill in the art, to use an ink which is both disclosed by either Zhu or Anton et al. and encompassed within the scope of the present claims.

However, applicants have filed a 1.132 declaration on 4/29/03, Paper No. 8, which compares ink within the scope of the present claims, i.e. comprising styrene-maleic anhydride copolymer and methyl methacrylate/butyl acrylate/acrylic acid copolymer, with inks outside the scope of the present claims, i.e. comprising either styrene-maleic anhydride copolymer alone or methyl methacrylate/butyl acrylate/acrylic acid copolymer alone. It is shown that the inventive

inks are superior in terms of storage stability and/or discharge stability (as compared to using methyl methacrylate/butyl acrylate/acrylic acid copolymer alone) or are superior in terms of adhesion and storage stability or adhesion, storage stability, and discharge stability (as compared to using styrene-maleic anhydride copolymer alone). Thus, 35 USC 103 rejections utilizing Zhu and Anton et al. are not envisaged given that the declaration establishes unexpected or surprising results over these references.

7. While applicants do not directly address the rejection of record utilizing Watanabe et al. in view of Ohta et al., it is the examiner's position that these rejections have not been overcome by the applicants' 1.132 declaration filed 4/29/03 for the following reasons.

The declaration compares ink within the scope of the present claims, i.e. comprising styrene maleic anhydride copolymer and methyl methacrylate/butyl acrylate/acrylic acid copolymer, with inks outside the scope of the present claims, i.e. comprising either styrene maleic anhydride copolymer alone or methyl methacrylate/butyl acrylate/acrylic acid copolymer alone. It is shown that the inventive inks are superior in terms of storage stability, adhesion, and/or discharge stability.

However, the declaration is not persuasive against the combination of Watanabe et al. with Ohta et al. given that this combination already discloses the combination of styrene maleic anhydride copolymer and methyl methacrylate/butyl acrylate/acrylic acid copolymer. Watanabe et al. disclose the use of two polymers, namely, methyl methacrylate/butyl acrylate/acrylic acid copolymer and styrene -maleic acid copolymer while Ohta et al. disclose the equivalence and interchangeability of using styrene-maleic acid dispersant as disclosed by Watanabe et al. with

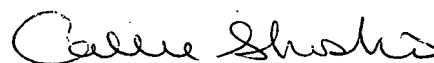
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using styrene-maleic anhydride dispersant as presently claimed. The declaration is not successful in overcoming the combination since there is no comparison between ink that contains styrene-maleic anhydride copolymer and methyl methacrylate/butyl acrylate/acrylic acid copolymer as presently claimed, with ink that contains styrene-maleic acid copolymer and methyl methacrylate/butyl acrylate/acrylic acid copolymer as disclosed by Watanabe et al. That is, there is no evidence that the styrene-maleic acid dispersant disclosed by Watanabe et al. is not equivalent and interchangeable with styrene-maleic anhydride dispersant disclosed by Ohta et al. Thus, Watanabe et al. and Ohta et al. remain relevant references against the present claims.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Primary Examiner
Art Unit 1714